Insulated Kitchen Piping

California Building Energy Efficiency Standards
Revisions for July 2003 Adoption

November 5, 2001

Description

In many homes, the hot-water line feeding the dishwasher can cool substantially between successive draws in the wash cycle. This cooling effect is particularly pronounced when the hot-water line runs under the floor slab, or above the insulation in an attic. The cooler water reduces the efficiency of the dishwasher, and can result in the occupants setting the water-heater temperature higher than needed otherwise.

A similar problem exists during kitchen food preparation and clean up. Numerous short draws of water are common. However, if the water cools between draws, then it is more likely that the water will be allowed to run continuously.

The solution is to insulate the hot-water line feeding the kitchen. In addition, the piping serving the kitchen should be a dedicated run so that it is not oversized to handle other loads that do not normally coincide with kitchen use. The resultant smaller piping will deliver the needed water more quickly.

The Standards should require that the hot water line feeding a kitchen be insulated. An exception could be made for kitchens immediately adjacent to the water heater.

Benefits

This measure will result in reduced water heater energy.

Time dependent valuation (TDV) is not expected to have a significant impact on this measure.

Environmental Impact

No significant environmental impact has been identified.

If the water heater setpoint can be reduced as a result of this measure, occupants are less likely to burn themselves while drawing hot water. Also, as water is drawn intermittently in a kitchen during food preparation and clean-up, pipe insulation prevents significant cool-down between draws, enhancing convenience.

Type of Change

Mandatory Measure	The change would add or modify a mandatory measure. Mandatory measures must be satisfied with either the prescriptive or performance compliance methods.

The proposed change expands the scope of the Standards to include pipe insulation for the piping serving a kitchen. This change would affect the Standards, manuals, and possibly compliance forms.

Measure Availability and Cost

Pipe insulation is widely available from a variety of manufacturers. It is stocked in all building supply stores. The cost to purchase and install the insulation is estimated to be $100 to $200 per home.

Useful Life, Persistence and Maintenance

We have not researched whether the commonly available closed-cell foam pipe insulation degrades over time. If this proves to be a factor, other types of insulation, such as fiberglass, are available.

The energy savings can be expected to persist for the life of the piping.

Performance Verification

This measure would be an additional item to verify in the plumbing inspection already required.

Cost Effectiveness

Cost effectiveness has not been established at this time.

Analysis Tools

Costs can be analyzed using common engineering principles.

Relationship to Other Measures

This measure is related to the measure recommending changes to hot-water pipe sizing.

Bibliography and Other Research

This measure is proposed based on the personal design experiences of J. Hirsch & Associates. Currently, this submittal is intended as a place holder to identify this topic as a subject that the Standards do not address. Further study will be required to develop the proposed regulations; however no funding source has been identified for this study.